



## **WATER RESOURCES RESEARCH GRANT PROPOSAL**

**Project ID:** 2005KY50B

**Title:** Effects of Reservoir Releases on Riverbank Erosion

**Project Type:** Research

**Focus Categories:** Geomorphological Processes, Floods, Sediments

**Keywords:** flood control, channel adjustment, streambank stability, sediment supply

**Start Date:** 03/01/2005

**End Date:** 02/28/2006

**Federal Funds:** \$12,894

**Non-Federal Matching Funds:** \$25,822

**Congressional District:** KY 2nd

**Principal Investigator:**  
Stephen Kenworthy

### **Abstract**

Alteration of natural river flow regimes by dams can have negative impacts on river channel morphology and aquatic ecosystems. These environmental costs must be balanced against the water resource benefits provided by dams and reservoirs. Changes in riverbank stability and channel width are commonly observed downstream of dams. These geomorphic impacts can lead to degradation of habitat and impairment of riparian and aquatic biological communities. This proposal seeks funding for a study of the influence of Green River Lake Dam on the hydrology and bank stability of the upper Green River of Kentucky. The upper Green River is of particular concern because of impacts on threatened and endangered species, and because of federal and state soil conservation programs aimed at improving water quality in the river. The geomorphic effects of the dam on the upper Green River are undocumented and thus poorly understood. The proposed research will analyze the historical impacts of the dam on bank stability and provide new information on the effects of hydrological modification by flood control reservoirs on channel dynamics in large alluvial river systems. This information will be valuable in planning flood control operations and land use practices that minimize the negative geomorphic and ecological effects of flow regulation. The scientific objectives of this research are to document historical rates of channel migration, changes in channel width, and spatial patterns of recent bank instability on the upper

Green River, and to relate these geomorphic changes to patterns of hydrologic modification by Green River Lake Dam. Rates of channel migration and channel width changes will be estimated from sequences of aerial photographs and other data sources. The hydrological impacts of Green River Lake will be evaluated by analyzing available streamflow records from gaging stations along the river. Locations of recent streambank instability will be mapped and bank morphology surveyed at selected sites. At these locations, rates of bank retreat will be monitored with erosion pins and related to observations of local fluctuations in river stage. Long-term monitoring of these sites will help understand mechanisms of bank retreat in relation to flow fluctuations and dam-related hydrologic alteration.